UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 5804

CSAH NO. 1

OVER THE

BIG FORK RIVER

DISTRICT 1 - KOOCHICHING COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512 (CEI 19)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure unit inspected at Bridge No. 5804, Pier 1, was found to be in good condition with no significant defects effecting the structure's structural integrity or stability. The channel bottom inspected around the substructure unit was generally stable with a minor increase in scour exposing more of the pier footing than was observed at the last inspection.

INSPECTION FINDINGS:

(A) There was footing exposure at the upstream and downstream noses of Pier 1. The maximum vertical exposure of the footing was 3 inches on the second footing step (seal) (2 foot, 3 inch total footing exposure including first footing step) found at the upstream east corner of the downstream portion of the footing. The vertical face exposure was caused by a 2 to 3 foot deep scour depression located adjacent to the footing.

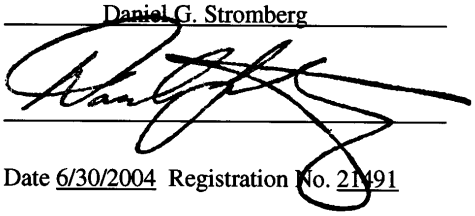
RECOMMENDATIONS:

(A) Monitor the extent of the scour and footing exposures during future inspections, and if found to be significantly progressing, then remedial measures may be warranted.

(B) Reinspect the submerged substructure unit at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

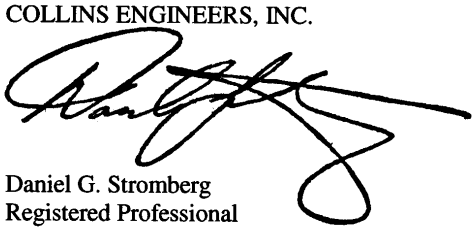
Daniel G. Stromberg



Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 5804

Feature Crossed: Big Fork River

Feature Carried: CSAH No. 1

Location: District 1 - Koochiching County

Bridge Description: The superstructure consists of a three span truss structure supported by two concrete abutments founded on piles and two concrete piers also on piles. The piers are numbered 1 and 2 starting from the west end of the bridge.

2. INSPECTION DATA

Professional Engineer Diver: Daniel G. Stromberg
State of Minnesota, P.E., No. 21491

Dive Team: Michelle D. Koerbel, Matthew J. Lengyel

Date: August 25, 2002

Weather Conditions: Sunny, ± 85^{o} F

Underwater Visibility: ± 3.0 Feet

Waterway Velocity: ± 2.0 fps

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 1

General Shape: The pier consists of two multi-sided columns connected by a slender transverse diaphragm wall. The pier columns are each supported by a separate two-stepped rectangular footing founded on piles.

Maximum Water Depth at Substructure Inspected: Approximately 8.0 Feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the south end of Pier 1.

Water Surface: The waterline was approximately 20.2 feet below reference. Waterline Elevation = 177.4.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

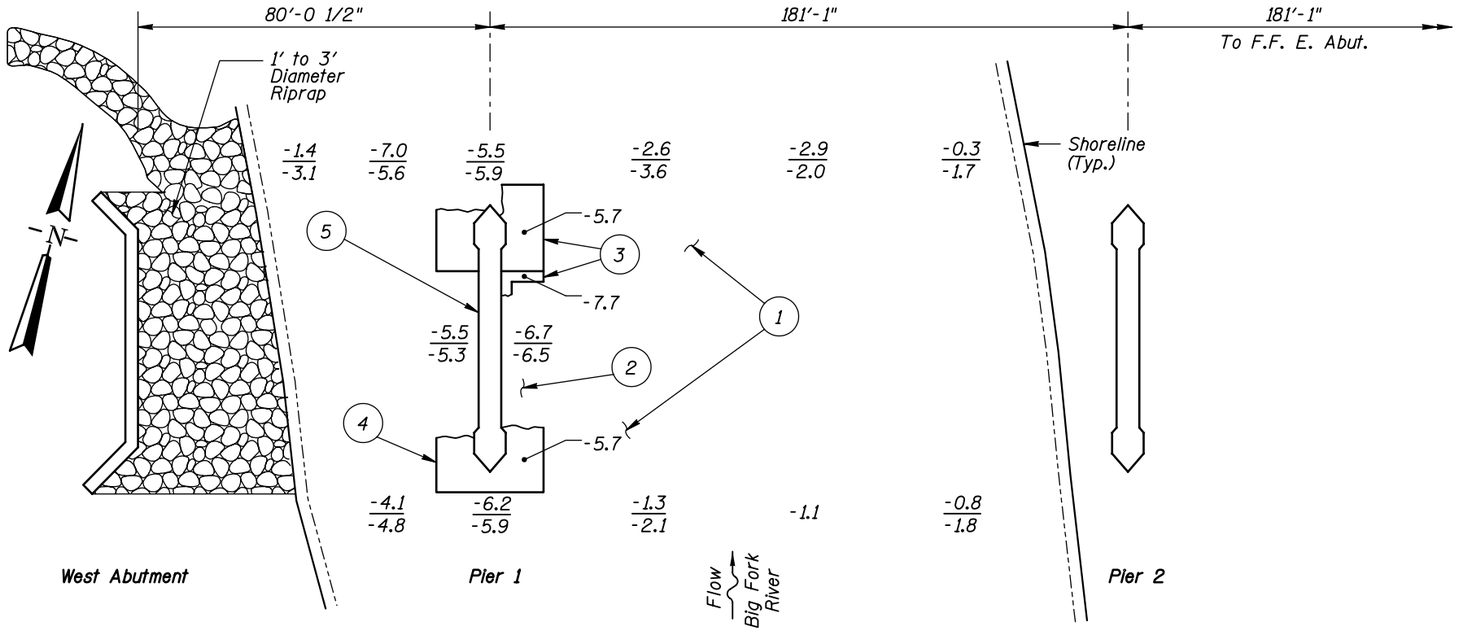
Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/08/02

Item 113: Scour Critical Bridges: Code J/92

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____ Yes __X__ No



SOUNDING PLAN

GENERAL NOTES:

1. Pier 1 was inspected underwater.
2. At the time of inspection on August 25, 2002, the waterline was located approximately 20.2 feet below the top of the cap at the upstream end of Pier 1. This corresponds to a waterline elevation of 177.4 based on previous report dated 8/21/97.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

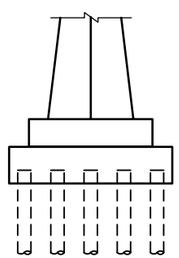
(1) The channel bottom material within 10 feet of the pier typically consisted of sand with gravel and scattered riprap with up to 3 to 6 inches of probe rod penetration.

(2) The channel bottom material between the footings consists of softer sand infilling.

(3) Footing exposure around the downstream nose with second step (seal) of footing exposed at the southeast corner with 3 inches maximum vertical exposure. Full 2 foot exposure of first step of footing.

(4) Footing exposure around upstream nose with 6 inches maximum vertical exposure at the upstream end.

(5) Concrete of pier shaft and footing was typically in good condition, with light scaling having 1/8 inch to 1/4 inch penetration, from 3 feet above the waterline to the mudline.



TYPICAL END VIEW OF PIER 1

Legend

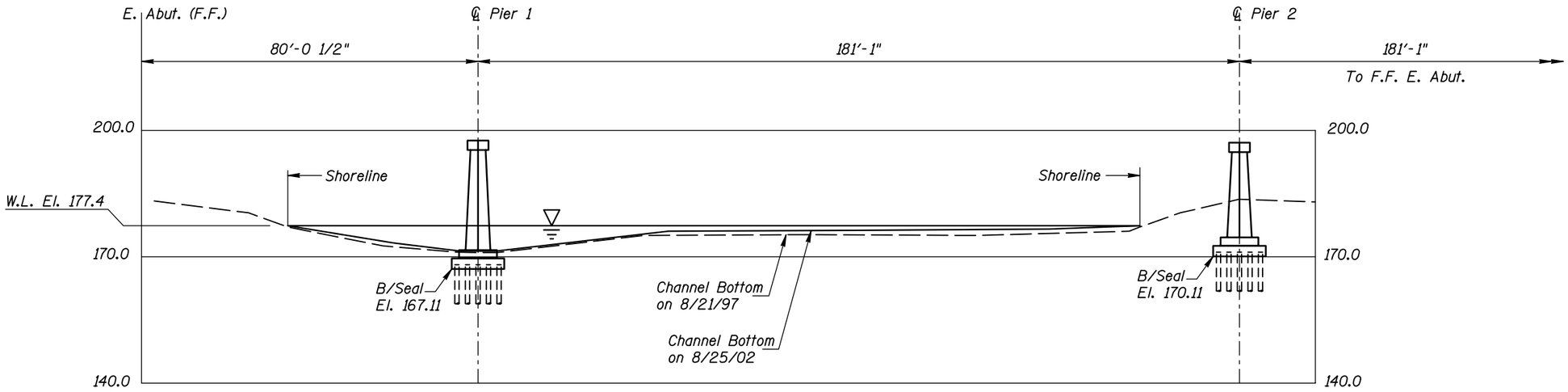
-2.0	Sounding Depth from Waterline (8/25/02)
-5.2	Sounding Depth from Waterline (8/21/97)

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

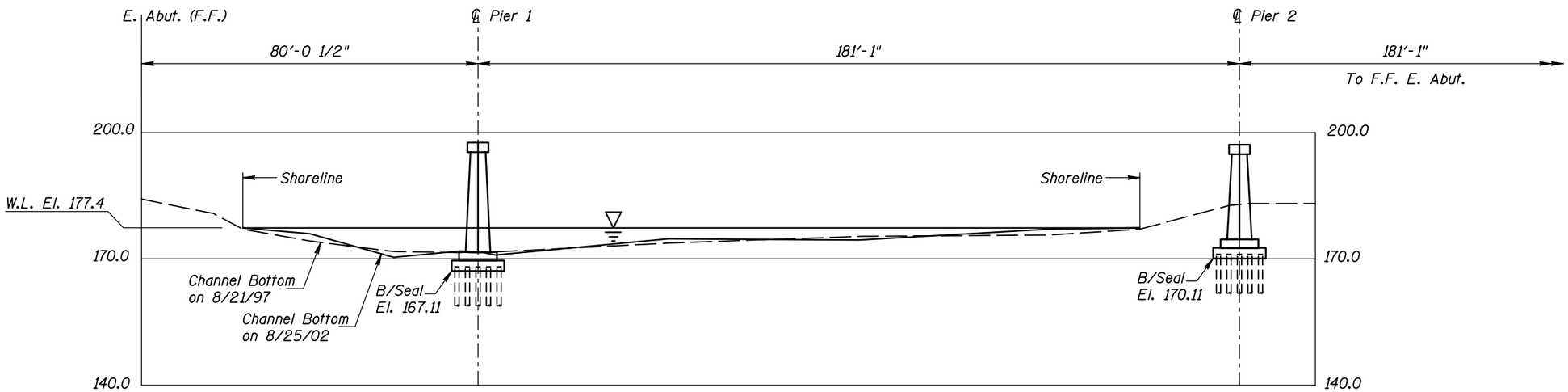
STRUCTURE NO. 5804
OVER THE BIG FORK RIVER
DISTRICT 1, KOOCHICHING COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: AUG. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35120019		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 5804
OVER THE BIG FORK RIVER
DISTRICT 1, KOOCHICHING COUNTY

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: AUG. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: 1"=30'
Code: 35120019		Figure No.: 2

Photograph 1. Overall View of the Structure, Looking Southeast.

Photograph 2. View of Pier 1, Looking East.

Photograph 3. View of Pier 2, Looking Northeast.

Photograph 4. View of Shore Protection on the West Bank, Looking South.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 25,2002
ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E.
BRIDGE NO: 5804 WEATHER: Sunny, ± 85° F
WATERWAY CROSSED: Big Fork River
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER
PERSONNEL: Michelle D. Koerbel, Matthew J. Lengyel
EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe Rod, Camera
TIME IN WATER: 1:40 P.M.
TIME OUT OF WATER: 1:55 P.M.
WATERWAY DATA: VELOCITY ± 2.0 fps
VISIBILITY ± 3.0 Feet
DEPTH 8.0 Feet maximum at Pier 1
ELEMENTS INSPECTED: Pier 1
REMARKS: The concrete of the shaft and exposed footings was in good and sound condition with light scaling from 3 feet above the waterline to the mudline. Both column footings were partially exposed. The upstream end of the upstream footing had a maximum vertical exposure of 6 inches. The full height of the first step (2 feet) of the downstream footing was exposed with the second step (seal) exhibiting a maximum vertical exposure of 3 inches.

FURTHER ACTION NEEDED: _____ YES ____X__ NO

Monitor the extent of the scour and footing exposures during future inspections, and if found to be significantly progressing, then remedial measures may be warranted.

Reinspect the submerged substructure at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 5804
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E. 21491
WATERWAY CROSSED The Big Fork River

INSPECTION DATE August 25, 2002

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (BRACING)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	8.0’	N	7	7	9	N	7	6	N	9	9	6	7	N	N	8	N	N

*UNDERWATER PORTION ONLY

REMARKS: The concrete of the shaft and exposed footings was in good and sound condition with light scaling from 3 feet above the waterline to the mudline. Both column footings were partially exposed. The upstream end of the upstream footing had a maximum vertical exposure of 6 inches. The full height of the first step (2 feet) of the downstream footing was exposed with the second step (seal) exhibiting a maximum vertical exposure of 3 inches.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.